ABSTRACT

YELTON, ANN. An Analysis of the Social Behavior of Developmentally Disabled Children. (1975) Directed by: Dr. P. Scott Lawrence. Pp. 86.

Two experiments were performed to study the effects of various teaching procedures on the social behavior of two to ten year old children classified as developmentally disabled. For the first experiment, it was hypothesized that instruction in one response class of social behavior would maximally increase that class of responding in subsequent free play relative to instruction in a different response class. The dependent measures included cooperation, giving, touching, directed verbalizations, and imitation measured during five minutes of free play at the end of each training session. Nonsocial perceptual skills, imitation, giving, and touching each were taught to four groups designed such that two orders of presentation were crossed with small and large children. A multivariate analysis of variance and five univariate analyses of variance were performed on the five dependent variables. It was found that teaching no particular behavior resulted in an increase for all dependent variables. No particular social behavior was facilitated in free play by directly training that behavior. It was concluded that the social behaviors studied are too complex to be simply increased

in a free play situation by teaching of a particular behavior in a structured teaching situation.

The second experiment was performed to determine if prompting and then reinforcing social behavior as in Experiment I resulted in more subsequent free play responding than the procedure of reinforcing unprompted social behavior or than a baseline condition of teaching perceptual skills. The same five dependent measures were used. There were four groups; small and large children were crossed with two different orders of teaching. A multivariate analysis of variance and five subsequent univariate analyses of variance were performed. Although a variety of social responses were elicited by prompting and reinforcing during the teaching situation, reinforcement alone had a more facilitory effect on social responding during free play. Further analysis of the data, however, led to the conclusion that prompting and reinforcing is more effective with children who produce very low levels of social behavior.

AN ANALYSIS OF THE SOCIAL BEHAVIOR OF DEVELOPMENTALLY DISABLED CHILDREN

by

Ann Yelton

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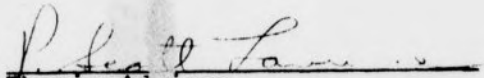

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APPROVAL PAGE

This thesis has been approved by the following committee of the Faculty of the Graduate School at the University of North Carolina at Greensboro.

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CHAPTER I

INTRODUCTION

Social behavior is defined by Skinner (1971, p.297) as "the behavior of two or more people with respect to one another or in concert with respect to a common environment". Socialization is the development of behavior to social stimuli (Bijou & Baer, 1965). Social responding is a very important and integral part of a child's total responding. A child learns through contact with his environment which includes his caretakers, teachers, and peers. O'Conner (1969) states that social interaction is "obviously an important factor in personality development" (p.15) because the development of social skills into complex behavioral repertoires is necessary for effective social functioning and because children who do not interact successfully with others will be responded to negatively by others which will further accelerate withdrawal. Social skills are used in learning other important skills; many necessary behaviors are learned by modeling and social reinforcement. The importance of social responding may also be evidenced by the prevalence of social items on tests used for assessing a child's level of functioning (e.g., Progress Assessment Chart [Gunsburg, 1972], and Vineland Social Maturity Scale [Doll, 1965]).

Many studies have shown that mental retardation is correlated with deficit social functioning (e.g., Hingtgen, Sanders & DeMyer, 1965; Johnson & Medinnus, 1969; Peebles, 1969; Ross, 1969; Weiner, 1970; Seagoe, 1970, 1971; and Kopfstein, 1971). These studies also indicate that the social behavior of retarded children is not simply retarded or slow, but is very different in many aspects from the social behavior of average children of every age. For example, Weiner found that the play activities of three and six year old normal children were better correlated than the activities of six year old children with mental ages of three to either of the other groups. Newman (1971) and Ross (1969) advocate direct social training as a means to increase performance of mentally retarded children. Since deficit social responding is so closely related to mental retardation, the direct training of social skills is a necessary part of any educational program. Thus, it is important to gain a better understanding of the social behavior of mentally retarded children, how these are interrelated, and which methods result in improved social responding.

Several studies have looked at interactions between environmental social events in a natural setting and various social behaviors of children. Kopfstein (1971, 1972) observed trainable retarded children in a free play situation. He categorized behavior to collect descriptive data about which peer behaviors were immediate antecedents and consequences to

other social behavior and to discover which peer reactions functioned as reinforcers. He concluded that the effect over time of peers on individual behavior is difficult to evaluate. The present author participated in a series of studies to systematically analyze the effects of peer and adult social behavior varying in dimension and amount on various social behaviors of preschool children. Among amount of verbalization, content of verbalization, timing of verbalization, giving objects to a child, and manipulating a novel toy, only the first had more than a transitory effect on a child's looking, cooperative, or talking behavior (Haskett, 1974; Yelton & Rubinsohn, 1971a; Yelton & Rubinsohn, 1971b; and Rubinsohn, 1972).

Most studies of social behavior involve the training of a specific skill or behavior class and the measurement of the effect of training of social responding. Very often the change in the trained behavior corresponds to an increase in other social behavior. Three studies were performed at the University of Washington with isolate preschool children. In the first study, play with children received adult attention, and as a result the child spent less time clinging to adults and more time in proximity to peers and interacting with them (Allen, Hart, Buell, Harris, & Wolf, 1964). Cooperation was shaped and reinforced in a second child, which resulted in more cooperation and longer and more positive interactions (Hart, Reynolds, Baer, Brawley, & Harris, 1964). For a

third child, play on outdoor equipment was shaped and reinforced, and increases in cooperative play, touching, verbalizing, and parallel play were found (Buell, Stoddard, Harris, & Baer, 1968). Azrin and Lindsley (1956) required children to perform a specific cooperative task for reinforcement and found reinforcement and extinction phases respectively accompanied by cooperative and hostile verbalizations. Davison (1964) found that when an autistic child was reinforced for obeying commands, she became more responsive to adults.

In the previously cited studies, specific responses were isolated for study and generally reinforcement was made contingent on the behavior. In several studies however, many social skills were simultaneously taught and prompts were more evident. DeMyer and Ferster (1962) trained many social responses and found increases both in behavior reinforced and in other social responses. Ross trained responses to many social situations using modeling, doll play, puppets, and films and found increases in social responding of educable mentally retarded children that surpassed normal levels. Ney, Mankley, & Palvesky (1971) found that training of self awareness, emotional relationships, imitation of adult behavior, and communication significantly raised scores on a developmental scale with schizophrenic boys. When many social responses are directly trained, there is still further generalization to other behavior.

One additional method has been used to increase social responding of normal children. Quilitch and Risley (1973) systematically varied the toys of seven year old children and found that when children were provided with toys previously rated "social", they engaged in far more group activity than when they were given "isolate" toys. The selection of toys is important in teaching social behavior and may also be important adjuncts to altering aggressive, verbal, and cooperative behavior. However, when the toys were reversed, the children immediately became isolate or social; no long term effects can be expected by toy selection alone.

The evidence shows that reinforcement of one or many social responses increases the amount of the reinforced behaviors as well as other social behaviors. The question naturally arises as to whether the use of prompts further increases the amount of social responding. Two methods of teaching social behavior were compared in Experiment II. The first method involved prompting physically, verbally, and by modeling many varied social activities and reinforcing successive approximations of them. The second method involved reinforcing the performance of social behaviors that occured without prompting by the experimenter. One might expect more behavior from the usual teaching method of encouraging activities and then reinforcing them. By prompting one can engage the children in a wide range of fun activities.

However, the criterion situation for recording social behavior in this experiment was during free play; thus, it was possible that the children would learn to rely on the prompts and thus have a lower level of spontaneous or unprompted interaction as recorded during the free play situation. One accidental finding supports this second hypothesis. Cohen, Wyon, and Richards (1969) observed the free play activities of normal preschool children in two classes. Among other results, they report that there was a higher level of social responding in the class with the least directive teacher.

Statement of the Problem

Experiment I was performed to determine the effects of teaching different specific social behaviors both on those specific responses and on other social behaviors. Children were instructed in nonsocial perceptual skills, imitation, giving, and touching; each of which were taught in twenty minute sessions for eleven days. Two orders of training were used and are summarized as follows: baseline (perceptual skills), imitation, giving, and then touching (B-I-G-T); or, baseline, imitation, touching, and then giving (B-I-T-G). Each order was given to one group of large children and one group of small children. The cooperation, giving, touching, directed verbalizations, and imitation of all children were measured in a five minute free play situation following each training session.

Experiment II was performed to determine whether prompting and reinforcing many varied social behaviors or reinforcing occurances of social behavior that were not prompted by the experimenter resulted in the most social responding during free play. The first method of teaching had the advantage of eliciting a variety of social responses and providing more opportunity for reinforcement of social behavior. However, since all behavior was first requested, children may not have generalized their responding to a free play situation. The second method of teaching involved reinforcing children for initiating social responses. Following baseline training of nonsocial perceptual skills, the method of prompting and reinforcing social behavior (P) and of reinforcing unprompted social behavior (R) were presented to each group in one of two orders (B-R-P or B-P-R). One group of large children and one group of small children received each order of presentation. There were ten days in each phase; sessions lasted twenty minutes. Similar to Experiment I, the cooperation, giving, touching, directed verbalizations and imitation of all children were recorded during a five minute free play period following each training session.

CHAPTER II

METHODS AND RESULTS COMMON TO BOTH EXPERIMENTS

Subjects

Children enrolled in the day training program at Kendall Center participated in both experiments. Henry Weissman Kendall Center is a county operated center located in Greensboro, North Carolina serving developmentally handicapped children. For Experiment I, sixteen children were employed (four groups of four children). Eleven children were previously involved in the program; five were new. Twenty children participated in the second experiment (four groups of five). Twelve had been previously involved in the first experiment, three children had previously been enrolled at Kendall Center but had not been involved in the first experiment, and five were new to the center. All children ranged in age from three to ten years and tested under eighty on standardized intelligence tests or were labeled "developmentally disabled" by a staff assessment. Children were classified as large or small by part of the staff based on age, size, and ability. Large and small children respectively, were divided randomly into two large and two small groups by drawing names. For Experiment II, several changes needed to be made by the Kendall staff after random assignment to fit other

schedules. In addition to the skills taught in this study, the children were taught speech, special education, self help, and motor skills each day.

Setting

Both experiments took place in a carpeted room with a couch, swivel chair, several stuffed chairs, one child's chair, a desk, one small table, and a toilet training chair. Toys included blocks, balls, hats, a purse, an open train and a tractor that could be rolled, storage boxes, and a wooden rock-a-boat for two or more children to rock or climb on. There was a play house during Experiment I but it was destroyed before Experiment II. Both training and observations occurred in this room. Teacher controlled activity toys included Milton Bradley Company's "Toys to Develop Perceptual Skills" that included beads, stacked rings, balanced rings, "feeley-meeley" (a box to put your hand in to feel for objects), cards with pictures, and a board game. A manual outlines programs to teach discriminate of colors and shapes, recognization of shapes, identification of objects by touch, number concepts, picture matching, and recognization of facial expressions. In addition, number bingo, animal pictures, paper, and crayons were used for controlled activities. A cassette recorder with prerecorded signals was played during data collection.

Assessment and Data Collection

All children were assessed by means of the checklist in Appendix A before each experiment to determine what social skills the children could perform when requested. This provided a mean to determine whether individuals and groups differed from each other initially in social responding. Items included in Appendix I were compiled from the Vineland Social Maturity Scale (Doll, 1965), Progress Assessment Chart (Gunsburg, 1972), and this author's teaching experience. Items include specific social responses and are in approximate ordered sequence within each category, but there are not necessarily equal numbers of items at different levels. A number score equaling the number of total items the child performed was used as an estimate of social responding; it was assumed that a child who performed 20 items is less social than one who performed 40 items. A second observer naive of treatment conditions observed 6 children on one assessment day and independently checked behaviors that occurred. Reliability $\frac{\text{agreements}}{\text{(agreements + disagreements)}} \times 100\%$ was computed to be 93.2%.

At the end of each 20 minute treatment session, five minutes were used to assess the amount of spontaneous social behavior by each child and each group in a free play situation using time sampling recording. This same method was used in addition to collecting data the first five minutes of three later sessions in each phase in order to compare behavior

immediately after treatment with behavior delayed from treatment by a day. A cassette recorder signalled 7 1/2 second intervals. The first interval was used to observe the children and the next to record on the data sheet what was observed (Appendix B1 and B2). Cooperation, giving, touching, directed verbalizations, and imitation were simultaneously recorded for each child using the criteria outlined in Appendix C. Thus, an observer could record that Jim and Jan cooperated, Jill gave, and Jack verbalized to another child during a seven and a half second interval. Such a code allowed maximum information in minimum observation time. This contrasts with Parten's code (Parten and Newhall, 1943) where only one child was observed during any interval and observation periods extended for an hour. Parten categorized free play activities as unoccupied behavior. solitary play, onlooker behavior, paralled play, associative play, and cooperative or organized supplementary play. Since the present study aimed to increase the amount of social participation, differentiation among the first three categories was judged unnecessary. Imitation is more inclusive than Parten's parallel play, giving and cooperation are included in Parten's associative play, and none of the children ever engaged in what Parten called cooperative or organized supplementary play. Touching and verbalizing to other children were felt also to be important measures of social behavior. Thus, the five dependent measures were selected.

There was only one difference between Experiment I and Experiment II; in the first experiment, if there was contact between children, a "touch" was recorded for each. In Experiment II, a touch was recorded only if it was judged that the child intended it. No rigid criteria were established to judge intent, but if there were any doubt, a touch was recorded. A second observer naive of experimental conditions recorded intermittantly to determine reliability.

Reliability was computed by the formula $\frac{\text{agreements}}{\text{agreements + disagreements}} \times 100\%$ where agreements were counted when both observers agreed that a behavior occurred during a seven and a half second interval regardless of which children were involved. Observer reliability for the first experiment which was taken in 18 percent of all sessions was 62.5%. For each category of behavior, the reliability was as follows: cooperation, 57.1%; giving, 38.8%; touching, 79.4%; verbalizing, 58.2%; imitation, 57.0%. For Experiment II, reliability was taken in 12 percent of all sessions; the overall reliability was 68.6%. The reliability for each behavior was as follows: cooperation, 63.7%; giving, 51.7%; touching, 81.1%; verbalizing, 53.9%; imitation, 67.5%. These numbers at first appear low, but except for giving in Experiment I, are judged acceptable for the following reasons. First, complex social behaviors were recorded. These usually have a low reliability when computed conservatively, as they were in this study, especially when they occur relatively

infrequently (Wildman, 1974). For example, using the traditional Parten Scale, Wintre (1974) obtained an overall reliability of 85.9% for all categories ranging from unoccupied to cooperative play. Parten and Newhall (1943) originally obtained 89% reliability. Wintre got 72% reliability for associative play (similar to cooperation in this study) and he got 0% for cooperative play (highly organized play). He obtained high reliability for the frequent categories of no social behavior which was not counted in this study. In addition, the reliability in this study could have been inflated by adding to the number of agreements the instances where observers agreed that a behavior did not occur. The observers thus agreed that certain behaviors occurred infrequently. For example, if one observer saw two "gives" in twenty intervals and the other saw one of these and one other, reliability would be $\frac{1}{1 + 2}$ X 100% or 33%, although for the purpose of computation both observers said the children gave twice.

Results: Data Common to Both Experiments

Children were labeled large or small based on staff opinion. Children were assessed before each experiment using the checklist of social behavior (Appendix A). The total number of responses performed by each child before each experiment are presented in Table 1 as well as average scores for each group. The groups of small children on the average, performed fewer social skills when requested than the groups

TABLE 1

NUMBER OF RESPONSES PERFORMED FROM APPENDIX I

	EXPERIMENT I			EXPERIMENT II	
B-I-G-T* Small	S_1	19	B-R-P Small	S_1	37
	S_2	35		S_2	31
	S_3	28		S_3	29
	S_4	45		S_4	49
	Average	31.8		S_5	58
				Average	38.8
B-I-G-T Large	S_1	45	B-R-P Large	S_1	60
	S_2	65		S_2	68
	S_3	53		S_3	69
	S_4	48		S_4	73
	Average	52.8		S_5	58
				Average	65.6

*Order of presentation of Conditions: B-Baseline I-Imitation Training T-Touch Training G-Give Training

TABLE I (Cont.)

	EXPERIMENT I			EXPERIMENT II	
B-I-T-G Small	S_1	9	B-P-R Small	S_1	64
	S_2	15		S_2	61
	S_3	51		S_3	58
	S_4	45		S_4	21
	Average	30		S_5	61
				Average	53
B-I-G-T Large	S_1	66	B-P-R Large	S_1	67
	S_2	40		S_2	70
	S_3	61		S_3	57
	S_4	42		S_4	63
	Average	52.3		S_5	63
				Average	64

of large children, although there was some overlap, especially in the second small group of Experiment II. These scores indicate that there were initial differences between groups of large and small children on at least this one measure of social behavior.

After each session, the children were observed for five minutes of free play. A group score was obtained from each observation period by counting the number of intervals in which at least one child engaged in that behavior; these scores for the four groups of each experiment are included in Appendix D. No correction was used to alter the numbers when children were absent because children were definitely not absent randomly or as often within or between phases, assumptions that would have been necessary to adjust the scores since all children did not interact equally often.

In order to determine whether the number of children present affected the amount of social behavior observed, the data from days with all children present is compared with days with at least one child absent. For each phase in each group of both experiments, the average number of interactions for each behavior for days on which no children were absent and from days on which at least one child was absent is presented in Table 2. No statistical test could be performed due to the irregularity with which children were absent. One hundred twenty-five matched comparisons could be made; the amount of social behavior with all children present within

TABLE 2

Average Number of Responses From Days With No Absences Versus Days With Absences

Experiment I

	Number of Days All Present	Responses C	G	T	V	I	Number of Days at least one absent	Responses C	G	T	V	I
Group B-I-G-T Small												
Baseline	10	2.8	1.1	4.1	.9	2.1	1	0.0	0.0	0.0	0.0	0.0
Imitation	9	4.8	1.1	6.1	.8	1.9	2	2.0	1.5	8.5	1.0	1.5
Touching	1	0.0	0.0	2.0	0.0	0.0	10	3.3	1.9	5.5	3.2	.9
Giving	0	-	-	-	-	-	11	5.5	3.2	7.5	4.2	.7
Total	20			7:8**			24					
Group B-I-G-T Large												
Baseline	11	3.6	2.1	10.9	.6	1.6	0	-	-	-	-	-
Imitation	8	3.4	1.5	8.9	.9	1.9	3	7.3	1.3	12.3	5.3	.7
Touching	6	5.0	1.0	12.3	2.2	.7	5	2.4	1.2	7.6	.2	1.8
Giving	2	3.0	3.0	13.0	1.0	3.0	8	1.5	1.1	5.1	1.5	2.4
Total	27			9:6			16					

* Order of presentation of condition

** The first number is how many times there was more behavior with no absences, the second when there were absences.

TABLE 2 (Cont.)

Experiment I

	Number of Days All Present	Responses C	G	T	V	I	Number of Days at least one absent	Responses C	G	T	V	I
Group B-I-T-G Small												
Baseline	8	1.2	3.8	1.9	0.0	.5	3	.3	.3	1.3	0.0	1.0
Imitation	6	.3	.2	7.0	.2	1.0	5	1.0	0.0	2.8	0.0	.6
Touching	9	.9	.2	5.7	1.0	.4	2	1.5	0.0	2.0	.5	2.0
Giving	4	1.0	1.0	3.5	.8	0.0	6	2.3	.2	3.5	.3	1.3
Total	27			12:6			16					
Group B-I-T-G Large												
Baseline	9	3.8	1.9	13.7	6.3	3.1	2	0.0	0.0	1.5	.5	.5
Imitation	10	7.9	3.6	14.7	2.7	2.0	1	1.0	3.0	1.0	1.0	0.0
Touching	6	5.3	1.7	12.0	10.2	.8	5	7.8	2.8	7.8	1.0	.6
Giving	3	2.0	7.0	17.0	5.0	5.7	8	2.4	2.4	6.0	1.0	1.4
Total	28			17:3			16					

TABLE 2 (Cont.)

Experiment II

	Number of Days All Present	C	G	T	V	I	Number of Days at least one or more absent	C	G	T	V	I
Group B-R-P* Small												
Baseline	4	2.3	.8	3.8	3.3	.5	6	3.7	.5	5.0	1.7	.8
Reinforce	5	7.4	.4	8.0	4.0	3.4	5	2.2	2.2	8.2	2.2	.8
Prompt & Reinforce	3	5.0	1.7	8.3	1.3	4.7	6	3.3	2.3	2.8	2.0	2.8
Total	12			8:7**			17					
Group B-R-P Large												
Baseline	6	1.2	.5	4.8	3.0	1.7	4	1.5	1.0	7.0	1.8	3.0
Reinforce	8	2.9	1.0	14.0	6.8	8.1	2	1.0	.5	12.0	1.5	6.0
Prompt & Reinforce	9	2.0	1.9	10.4	7.7	6.7	1	0.0	0.0	2.0	1.0	0.0
Total	23			11:4			7					

* Order of presentation of conditions

**The first number is how many times there was more behavior with no absences; the second when at least one absence.

TABLE 2 (Cont.)

Experiment II

	Number of Days All Present	Responses C	G	T	V	I	Number of Days at least one or more absent	Responses C	G	T	V	I
Group B-P-R Small												
Baseline	7	3.3	.6	4.6	6.4	1.1	3	3.0	.3	1.0	3.3	1.0
Reinforce	6	2.5	.7	2.3	3.8	3.2	4	.3	2.0	2.5	8.3	.5
Prompt & Reinforce	10	3.9	2.1	3.3	7.7	4.5	0	-	-	-	-	-
Total	23			6:4			7					
Group B-P-R Large												
Baseline	7	1.6	.4	9.7	7.3	1.9	3	4.0	0.0	7.7	6.7	1.3
Reinforce	3	2.0	0.0	5.0	5.0	1.0	7	1.1	.9	9.4	5.3	1.4
Prompt & Reinforce	6	2.3	1.5	11.0	5.5	1.6	4	3.3	.5	5.5	2.7	2.0
Total	16			8:7			14					

each phase was greater than when at least one child was absent 78 times (62.4%), was absent 45 times (36%), and was the same two times. Thus, there is some tendency for groups with all children present to interact more often. Some confounding from this may have affected scores from phases with relatively few or many absences. During Experiment I, attendance tended to decrease for all groups over time so biases would have made treatments appear worse relative to baseline. No consistent bias for any phase can be hypothesized for Experiment II.

Another major question concerning both experiments, is the generality of any effects. Data was recorded immediately after training and it is possible that behavior could have been transitory. Therefore, for three days during each phase of each group of both experiments, data were recorded at the beginning of the session as well as at the end to determine if behavior would generalize from the preceding day. Comparisons of beginning of session data with the data from the preceding day were statistically performed using a multivariate analysis of variance followed by five univariate analyses of variance for each experiment. One beginning of session day and the preceding end of session day were not recorded due to the time difficulty, so average scores for the remaining two days were used to bring the number of observations in every cell to three, and two degrees of freedom were sacrificed. The results of these analyses are

summarized in Table 3 and significant results were as follows. The end of session data did not differ from the beginning of session data for either experiment. There is some suggestion due to the significant univariate tests that cooperation and touching in Experiment I were more frequent at the end of a session than on the next day and that imitation in Experiment II was more frequent on the next day. These results are only suggestive because the multivariate test was not significant. Age, condition, their interaction, but not order interacted significantly with beginning versus end in Experiment I. Small children interacted more immediately after training than the next day and large children tended to be more consistent; cooperation, touching, and verbalizing were all significantly affected in this way. The interaction with condition is more complex because there is a different patterning for each of the five dependent measures, especially touching and verbalizing which were each significant alone.

For Experiment II, the only significant multivariate effect was the three way interaction between beginning versus end, age, and order. This indicates that when each group is individually considered, there is some differential responding between the end of sessions and the beginning of sessions. There is no consistent ordering for all dependent measures; neither beginning nor end is clearly superior for any individual group.

TABLE 3

Cell Means and Significance for Beginning Versus End of Session Data

Experiment I

Beginning - End (-) =

Beg	End	
2.6	3.3	*
1.6	1.7	-
7.8	8.5	*
2.0	1.8	-
1.1	1.6	-

Beginning - End X Order (-) =

	Beg	End	
BIGT	2.0	4.7	*
	.9	1.3	-
	7.6	8.1	-
	1.6	1.2	-
	1.2	2.0	-
BITG	3.2	1.9	
	2.3	2.2	
	8.1	8.8	
	2.5	2.4	
	1.0	1.2	

---

* indicates significance at $p < .05$. If after description, it refers to the MANOVA. If after number, it refers to univariate test on that variable.

Arrays of five numbers refer respectively to cooperation, giving, touching, verbalizing, and imitation.

TABLE 3 (Cont.)

Experiment I

Beginning - End X Condition (*) =

	Ba	I	G	T	
Beg	2.2	2.7	3.0	2.5	-
	1.7	1.7	1.7	1.5	-
	10.6	7.8	8.4	4.5	*
	.7	1.4	4.7	1.3	*
	1.8	.8	1.2	.8	-
End	1.3	6.5	1.7	3.7	
	1.6	1.5	.8	3.0	
	7.0	9.5	8.3	9.0	
	1.5	.9	2.0	2.8	
	1.6	1.3	.7	2.8	

Beginning - End X Age (*) =

	Beg	End	
Young	1.1	2.7	*
	.5	3.2	-
	3.9	5.5	*
	.8	1.2	*
	.4	.8	-
Old	4.0	3.9	
	2.7	2.6	
	11.8	11.3	
	3.3	2.4	
	1.8	2.3	

Age X Beginning - End (*) - cooperations above (*)
X
Conditions

---

* indicates significance at $p < .05$. If after description, it refers to the MANOVA. If after number, it refers to univariate test on that variable.

Arrays of five numbers refer respectively to cooperation, giving, touching, verbalizing, and imitation.

TABLE 3 (Cont.)

Experiment II

Beginning - End (-) =

Beg	End	
3.0	2.6	-
1.6	1.3	-
5.9	6.8	-
4.0	3.7	-
3.1	1.5	*

Beginning - End X Order (-) =

	Beg	End	
BRP	4.8	3.3	-
	1.8	1.4	-
	4.1	5.1	-
	3.5	3.1	-
	3.3	1.6	-
BPR	3.2	1.7	
	1.4	1.1	
	7.6	8.4	
	4.6	4.3	
	3.0	3.9	

Beginning - End X Age & Order (*) =

	BRP Young	BRP Old	BPR Young	BPR Old	
Beg	5.9	3.9	3.6	2.4	-
	1.7	2.4	1.8	.4	-
	6.4	7.7	1.9	7.6	-
	3.2	3.3	3.8	5.8	-
	2.8	4.7	3.8	1.3	*
End	2.5	1.6	4.0	1.8	
	1.9	1.3	.9	.9	
	7.7	8.4	2.6	8.3	
	1.5	4.2	4.8	4.4	
	1.2	3.8	2.0	4.0	

* indicates significance at $p < .05$. If after description, it refers to the MANOVA. If after a number, it refers to univariate test on that variable.

Arrays of five numbers refer respectively to cooperation, giving, touching, verbalizing, and imitation.

TABLE 3 (Cont.)

Experiment II

Beginning - End X Age (-) =

		Young	Old	
Beg		4.9	3.0	-
		2.1	1.2	-
		7.0	4.7	-
		3.3	4.8	-
		3.7	2.6	-
End		2.0	2.9	
		1.6	.9	
		8.1	5.5	
		2.9	4.6	
		2.5	3.0	

Beginning - End X Condition (-) =

		B	R	P	
Beg		4.0	5.6	2.3	-
		1.0	2.3	1.6	-
		6.3	5.3	4.7	-
		3.7	4.5	3.9	-
		3.0	4.7	1.8	-
End		1.7	3.7	2.7	
		.7	1.7	1.4	
		4.9	9.3	4.4	
		4.2	4.2	2.9	
		.5	3.8	1.9	

---

* Indicates significance at $p < .05$. If after description, if refers to the MANOVA. If after a number, it refers to univariate test on that variable.

Arrays of five numbers refer respectively to cooperation, giving, touching, verbalizing, and imitation.

Discussion of Common Results

For both experiments, real differences in social responding exist between groups of small children and large children which justifies the division of children into large and small size blocks in subsequent analyses. Although children were often absent, reasons for their absences were not related to this study in any obvious way, and the data indicate that groups with children absent did not differ greatly from groups with all children present. Any bias incurred by absenses in Experiment I would work against any obtained result. Thus, it is felt that the absenses were not a serious problem.

No consistent differences were found between the behavior at the end of a session and results recorded at the beginning of the next session. Thus, results obtained in these experiments may be generalized beyond the five minutes immediately following training at least to the next day.

Together these data show that small and large groups truly differ, that the results are unlikely to be artifacts of absences, and that results are generalizable beyond the period immediately following the termination of treatment.

CHAPTER III

EXPERIMENT I

Procedure

The first experiment assessed the relative effects of teaching each of three response classes of social behavior on the spontaneous emission of social behavior. In a free play situation, social behavior that occurs may be categorized into one or more of the following categories: attending to social stimuli, imitation, giving, touching, directed verbalizations, and cooperation and sharing. Attending to social stimuli includes any response to another person, such as looking, crying, or smiling, and includes children's first social responses. Since each of the other categories includes attention to a social stimulus, attention was not considered by itself. Each of the other categories, is described in Appendix C; all five were used as dependent variables in the criterion free play situation. It was decided that imitation, giving, and touching would receive individual training by prompting, shaping, and reinforcement. The children received separate training in speech which would confound training of directed verbalizations. Cooperation occurs developmentally later than the other categories (Doll, 1965) and thus was considered only as a dependent measure to determine how training of the other response classes affect its rate of occurance.

This experiment involved four phases, each lasting eleven days. The phases included baseline, teaching imitation, teaching giving, and teaching touching in one of two specified orders (explained later) for each group. Baseline data were collected during the first phase for each group. All children were taught perceptual skills and no social behavior was reinforced unless it occurred coincidentally with correct answers. Some improvement could have been expected since the children were intermittently reinforced for social behavior in other classes and because improvement in other areas may have had effects on social responding.

Imitation was trained by verbally prompting attention to other children, pointing and turning heads when necessary. If one child engaged in a discriminable motor activity, attention was prompted in a second child, and then he was physically prompted to perform the same behavior. Both children were reinforced for doing the same thing. Prompts were gradually faded. If no child spontaneously emitted a behavior that could be imitated, the experimenter prompted an activity for one child and proceded with prompts for imitation with a second child.

To train physical contact, touching of some part of one child was verbally prompted (i.e. "touch Mary's hair"). Children were reinforced for complying with commands and for being touched. Manual prompts were used to assist children

who could not follow verbal commands. Touching with toys and with different parts of the child's body were also prompted (i.e. "everyone touch feet", Jack touch Mary's stomach with your head", "touch the blcok to Jack's foot"). Most of the children did not understand all the verbal prompts, but learned to perform the required behaviors with minimal guidance. Also, since touching was prompted throughout the session, any touching that was not specifically requested was reinforced.

Giving was also taught by verbal and manual prompts. Many toys were used and the children were asked to hand them, toss them, roll them, place them on the floor to be immediately picked up, or to use some other method to transfer the object. Physical prompting was used when needed. In addition, the children were requested to give food to each other. Children were reinforced for giving and also for receiving objects. Reinforcement in all phases consisted of verbal praise paired intermittantly with physical contact and food.

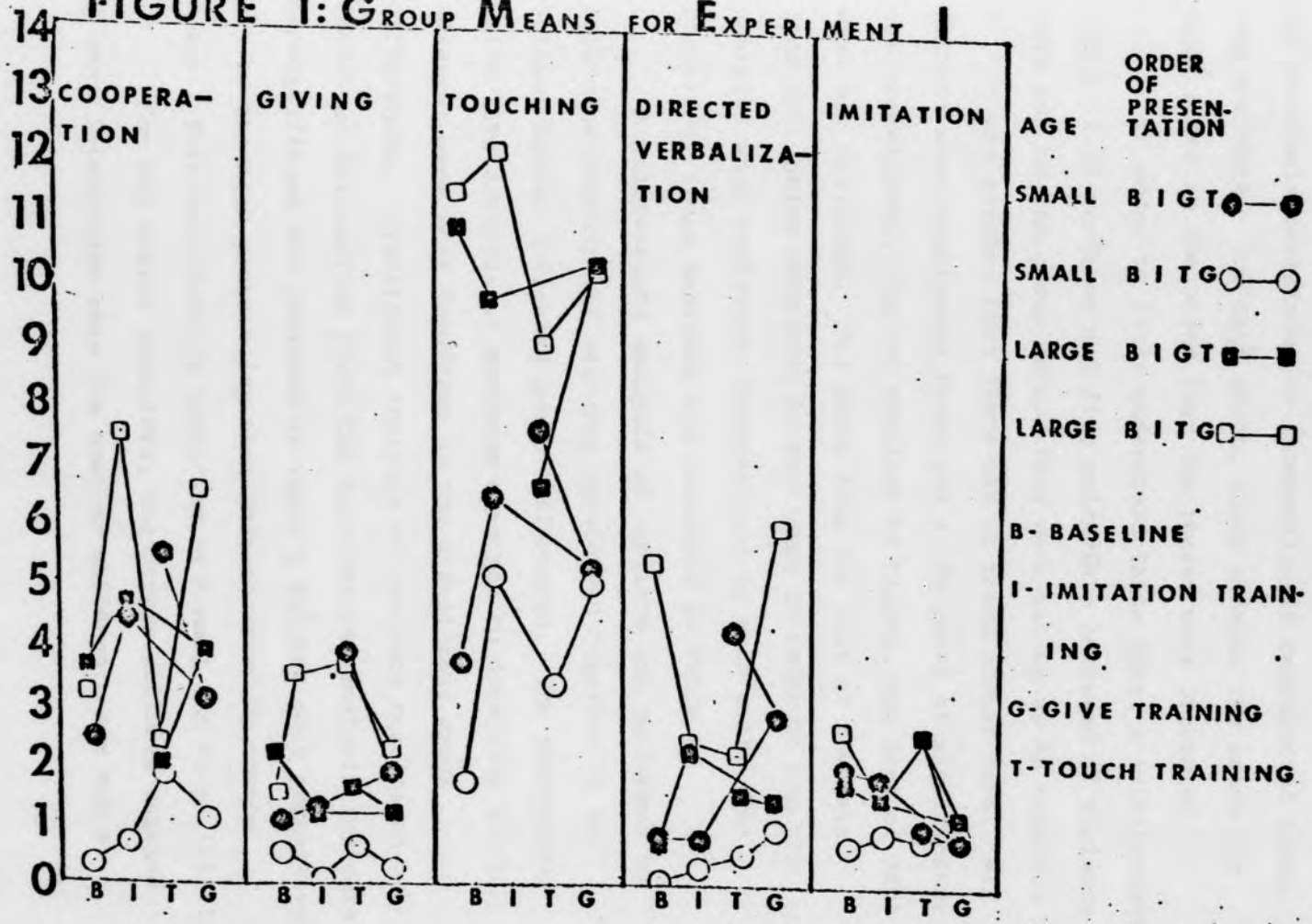
Giving and touching usually require physical proximity whereas imitation does not. Imitation on the other hand, requires more selective attention. Thus, it is likely that Give Training or Touch Training would effect giving, touching, and cooperation more than it would effect imitation, and that Imitation Training would have its primary effect on imitation and possibly also on directed verbalizations but

would minimally effect giving, touching, and cooperation. For these reasons, two orders of training were chosen. All groups first received Imitation Training. By comparing the rates of improvement in the various observational categories with the improvement rates observed during perceptual training (baseline), one could determine the effect of Imitation Training on each of the observational categories. For one group of large children and one group of small children, Give Training was trained next, and the various effects of this on the dependent measures of social behavior were assessed. In particular, one could observe the effect of Give Training on touching. Finally, the groups received Touch Training, and although one could see if there was more giving accompanying this training, it is compounded by the fact that Give Training was previously administered. Thus, for the remaining two groups, Touch Training was given first with particular interest in how it effects giving, and Give Training was trained last.

Results

The group scores for each session are presented in Appendix D. In computing these scores, whenever there was a discrepancy between the primary observer and the reliability observer, the observation from the primary observer was used. For each group, the eleven group scores in ecah phase were averaged; those means for all groups are presented in Figure 1. Each of the five dependent measures of social behavior is

FIGURE 1: GROUP MEANS FOR EXPERIMENT I



presented separately on the abscissa. The average number of intervals containing an interaction is represented along the ordinate. For each group, lines connect the means for each phase in the order that the phases were presented.

In order to fully understand these data, a multivariate analysis of variance and five univariate analyses of variance were run on the group data. They were set up as in Appendix E. It was assumed that there was no trend across days. All factors were considered fixed and a .05 level of significance was preselected. Due to problems of timing, two days of data were not collected. The means from the rest of the data from that phase were used in each case in order to run the analyses with equivalent observations in each cell. The results of these analyses are presented in Table 4.

A multivariate analysis of variance was performed to determine whether all measures considered together in an optimal manner indicated group differences. The subsequent univariate analyses of variance were run to determine which measures were most important in the significant group differences. Significant analysis of variance results on a factor or interaction where the multivariate analysis indicated nonsignificane are included in Table 4 but are only suggestive due to the high probability that they occurred by chance alone. This procedure is justified by Hummel and Sligo (1971).

For all social behaviors, the larger children engaged in more interaction than the smaller children. Age was a

TABLE 4

Cell Means and Significance

Experiment I
Main Effects

Age (*)			
	Y	O	
	2.3	4.1	*
	.9	2.0	*
	4.7	10.0	*
	1.2	2.6	*
	1.0	1.8	-

Order (-)			
	BIGT	BITG	
	3.6	2.8	-
	1.4	1.5	-
	7.4	7.3	-
	1.7	2.2	-
	1.5	1.3	-

Condition (*)			
	B	I	
	2.4	4.2	-
	1.3	1.5	-
	7.0	8.4	-
	1.7	1.3	-
	1.7	1.5	-
	G	T	
	3.6	2.9	-
	1.4	2.3	-
	7.6	6.8	-
	3.0	2.1	-
	.9	1.7	-

Order X age (*)				
		BIGT	BITG	
Y		3.8	.9	*
		1.5	.3	*
		5.5	3.9	*
		2.0	.4	*
		1.3	.8	-
O		3.5	4.8	
		1.4	2.7	
		9.3	10.7	
		1.3	3.9	
		1.7	1.9	

Order X Condition (-)					
		B	I	G	T	
BIGT		3.1	4.4	3.4	3.7	-
		1.5	1.1	1.5	2.4	-
		7.3	8.2	7.7	7.2	-
		.7	1.5	2.5	2.8	*
		1.8	1.7	1.1	1.6	-
BITG		1.6	4.0	3.7	2.0	
		1.0	1.8	1.2	2.1	
		6.6	8.6	7.5	6.3	
		2.6	1.2	3.5	1.3	
		1.6	1.2	0.7	1.7	

* refers to significance at $p < .05$. When after name, it refers to the MANOVA. When next to number, it refers to the univariate test for that variable.

Array of five numbers refers respectively to cooperative, giving, touching, verbalizing, and imitation.

TABLE 4 (Cont.)

Experiment I
Main Effects

Condition X Age (*) =

		B	I	G	T	
Y		1.4	2.5	1.8	3.7	*
		.7	.7	.8	1.5	-
		2.7	5.6	4.9	4.3	*
		.4	.5	1.5	2.1	-
		1.3	1.3	.7	.8	-
O		3.4	5.9	5.2	2.0	
		1.8	2.3	1.6	2.5	
		11.2	10.0	10.2	7.7	
		3.0	2.2	3.7	1.7	
		2.2	1.6	1.0	2.4	

Condition X Age (-) X Order =

		B	I	G	T	
BIGT	Young	2.5	4.3	3.0	5.5	-
		1.0	1.2	1.8	3.2	-
		3.7	6.5	5.2	7.6	-
		.8	.8	2.9	4.2	-
		1.9	1.8	.9	.7	-
BIGT	Old	3.6	4.5	3.8	1.8	
		2.1	1.1	1.1	1.5	
		10.9	9.8	10.2	6.7	
		.6	2.1	1.3	1.4	
		1.7	1.5	1.2	2.5	
BITG	Young	.2	.6	1.0	1.8	
		.4	.1	.2	.5	
		1.7	5.1	5.0	3.5	
		0.0	.1	.9	.5	
		.6	.8	.7	.8	
BITG	Old	3.1	7.3	6.5	2.3	
		1.5	3.5	2.2	3.6	
		11.5	12.1	10.1	9.0	
		5.3	2.3	6.0	2.1	
		2.6	1.6	.7	2.5	

* refers to significance at $p < .05$. When after name, it refers to the MANOVA. When next to number, it refers to the univariate test for that variable.

Any array of five numbers refers respectively to cooperation, giving, touching, verbalizing, and imitation.

significant factor in the multivariate analysis and for each univariate analysis except for imitation. Order of presentation did not result in group differences. Age and order interacted significantly; order one (B-I-G-T) resulted in similar levels of social behavior for both ages and order two (B-I-T-G) resulted in a small amount of social behavior for small children and a large amount of behavior for the larger children. Since each age-order combination is represented by a unique group, this interaction is probably due to individual group aspects. The differences causing the interaction effect are evident in Baseline Training and Imitation Training conditions which were presented first and second for all groups.

Methods of teaching resulted in differential social responding for all groups when all five social responses are considered together, but none of them considered singly were significant. Training also differentially affected large and small children, especially for cooperation and touching. In particular, the following effects of training can be observed from the group means of all four groups (Figure 1). With Imitation Training, cooperation increased from baseline for all groups and reached the maximum level for the experiment for the larger children. Giving and verbalizing were inconsistent, touching increased from baseline in three of the four groups, and imitation remained constant in three groups and decreased in the fourth. With Touch Training, cooperation reached its maximum level for all phases in both small groups

and reached its lowest level for all phases in both large groups. Giving reached the maximum level for three groups and was high for the fourth. Touching reached the lowest level of all phases for both older groups; one small group was high and the other was low.

There was no consistent effect for verbalizations. Imitation generally reached the highest experimental level for the large children; one small group was high and the other was intermediate. With Give Training, cooperation dropped from the previous condition in three of the four groups. Giving occurred less than with Touch Training for all groups and did not differ from baseline values. Touching and verbalizing did not change systematically in this condition. Imitation reached the lowest point for three groups and the lowest except for one condition for the fourth group.

The small children increased their verbalization level over time regardless of condition. Also, the large children touched most during Baseline, the small children touched least, and the amount of touching for large children was much greater than the small children.

Discussion

The results from Experiment I are best summarized as complex. Interpretation is compounded by the problem that when many statistical tests are run and many graphs compared, some significance should be expected by chance alone. The purpose of this experiment was to see how training specific

social behaviors differentially affected the occurrance of five different but not necessarily independent social responses. As expected, large children performed more social behavior than small children and the order of training did not matter. The order-age significant interaction suggests that the two small groups were not equivalent and the two large groups were not equivalent even though the initial assessment (Appendix A) indicates that they were very similar.

The four treatment conditions produced significantly different levels when all social behaviors during the subsequent free play period were simultaneously considered. Individually considered, the following trends were noticed, although no differences by themselves were significant. Cooperation in free play which is probably the most developmentally advanced social behavior observed in this study, was facilitated by Touch Training in small children and by Imitation Training in large children. Touch Training had a detremental effect on cooperation in large children. Giving was a low frequency behavior with low observer reliability, so conclusions concerning it are tenuous. In general, Touch Training most facilitated free play giving; Touch Training always corresponded to more giving than Give Training even though Touch Training preceded Give Training as often as it followed it. It is indeed surprising that giving in free play is better facilitated by teaching touching than by directly teaching giving. Since

there was no difference between end of session and beginning of session giving, this result is apparently not the result of an immediate fatigue effect that would cause practice in giving to result in less subsequent giving.

Although free play touching decreased during Touch Training for three groups, it must be pointed out that many scored touches were aggressive. From the data collected, one cannot determine whether or not the children learned to play more appropriately with less hitting (and possibly more appropriate contact), which is the opinion of the observer. Although there is a difference between end of session and beginning of session touching, inspection of the data shows that during Touch Training any difference would be in the direction of more touching at the end of the session; thus, there is no immediate fatigue effect.

Verbalizing did not appear to be affected by treatment. Touch Training resulted in highest levels of imitation in free play for large children and imitation did not appear to be affected by treatment for small children. Imitation Training did not increase free play imitation. There is no significant difference between end of session and beginning of session imitation. There is, however, a slight trend towards more imitation immediately after training than on the next day. Thus, there is no fatigue effect causing less imitation during Imitation Training.

This study was interested in discovering how structured training affected subsequent free play responding. No measure was taken to determine whether the dependent measures of interest increased during the actual training session but one would have at least observed large increases in the target behavior during training of that behavior. For example, with Give Training the amount of giving during training increased; the experimenter was actively eliciting this behavior from the children. However, whatever increase of the target behavior occurred during training did not generalize to a free play situation; training of a particular behavior did not increase the occurrance of that behavior in subsequent play. Give training was ineffective in increasing any aspect of social behavior during free play. Imitation Training and Touch Training were differentially effective for different age children or different social behaviors. All social behaviors during free play do not covary together; some may increase in frequency after training while others decrease.

CHAPTER IV

EXPERIMENT II

Procedure

This experiment compared the method of prompting, shaping, and reinforcing many varied social activities with the method of reinforcing unprompted occurrances of varied social interactions in terms of amount of interaction in a free play situation. For all four groups, Baseline was taken after an initial period that was used to train observers and allow the children to adjust to the situation. During Baseline, perceptual skills were taught to each child individually; no social behavior was reinforced unless it coincided with a correct answer. After Baseline, one group of large and one group of small children received the first method (Prompting and Reinforcing) and the other two groups received the second method (Reinforcement of unprompted social behavior). Subsequently, the groups were reversed. All phases lasted ten days.

For the first method, the activities taught were taken from Appendix A which includes a wide sampling of social behaviors generated from Appendix C that could be specifically prompted. Each session included equal numbers of activities from all five categories in a mixed up order that was predetermined. As in the first experiment, behavior was

prompted and the behavior or approximation of it was reinforced.

For the second method, the experimenter prompted no behavior but reinforced all different behaviors as defined in Appendix C that occurred without prompting. In order to elicit a variety of behaviors, repetitions of the same behavior by the same child were not continuously reinforced. The experimenter reinforced any social behavior that occurred unless the child had already performed that behavior within the last ten seconds. If an activity continued for a period of time, the experimenter administered fewer reinforcers. Reinforcement consisted of attention sometimes paired with food, touching, and praise.

Results

Similar to Experiment I, the session by session group scores are presented in Appendix F and the average group scores for each phase are presented in Figure 2. A multivariate analysis of variance and five analyses of covariance were performed on the group data and were set up as in Appendix G. One session was missing due to difficulties of timing, and the average for the rest of that group and phase was substituted to make the number of observations in each cell equivalent. Results are summarized in Table 5.

Age was a significant factor, but neither small nor large children interacted exclusively more often. The small children cooperated significantly more often and large children touched and imitated significantly more. Order was

FIGURE 2: GROUP MEANS FOR EXPERIMENT II

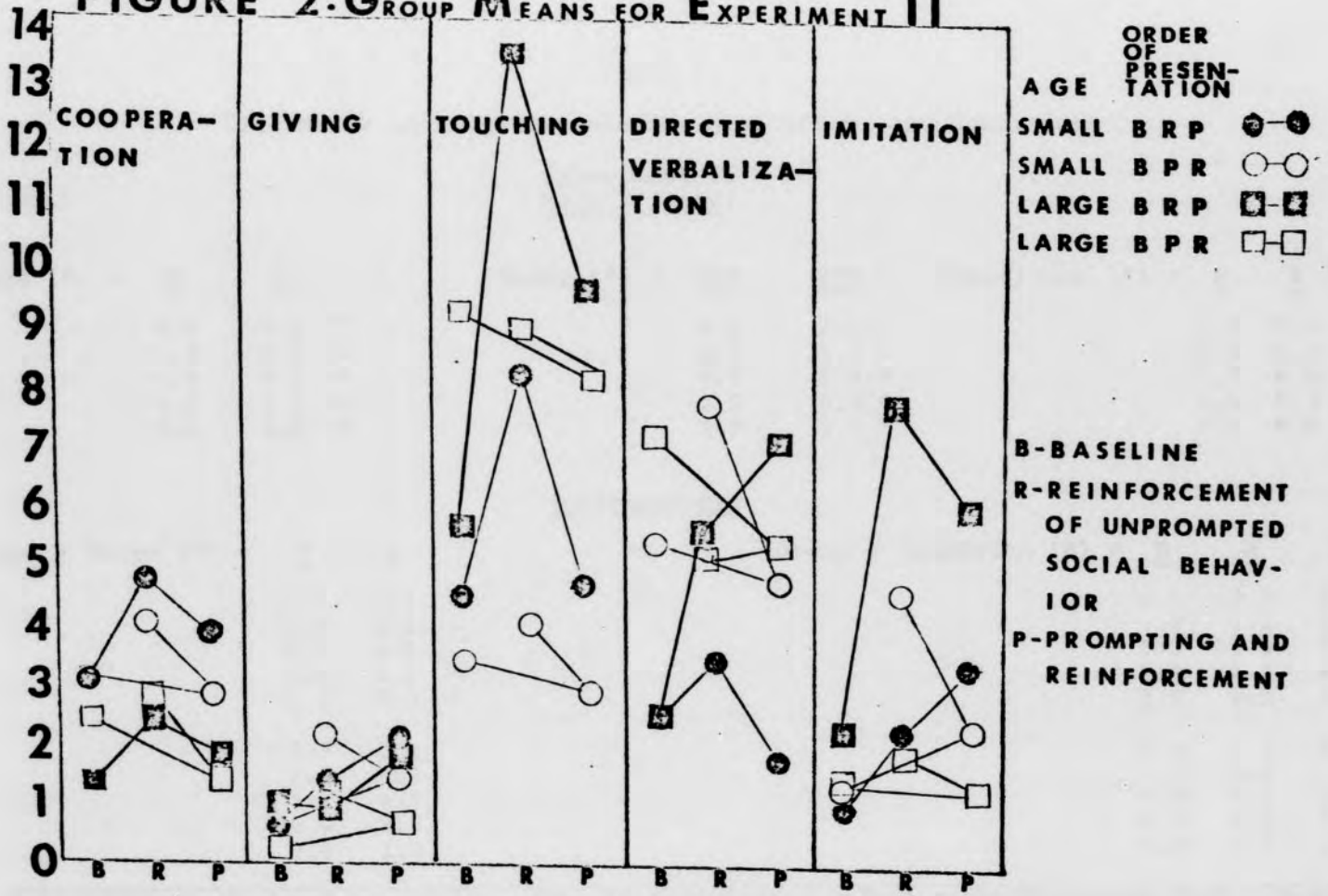


TABLE 5

Cell Means and Significance for Age, Order, and Conditions

Experiment II

Main Effects:

Age (*) = Y	O		Order (*) = BRP	BPR		Condition (*) = B	R	P	
3.6	2.0	*	2.9	2.7	-	2.5	3.5	2.5	-
1.3	0.9	-	1.3	1.0	-	0.6	1.4	1.4	*
4.4	9.2	*	7.7	5.9	*	5.7	8.5	6.2	*
4.2	5.3	-	3.7	5.8	*	4.4	5.3	4.7	-
2.3	3.5	*	3.7	2.1	*	1.5	4.0	3.2	*

Interactions:

Age X Order (*) = Y	O		Order X Condition (*) = B	R	P	
3.9	1.9	-	2.2	3.7	2.8	-
1.3	1.2	-	.8	1.1	1.9	-
5.7	9.6	-	5.1	10.9	7.1	*
2.4	5.1	*	2.4	4.4	4.4	-
2.1	5.3	*	1.5	4.9	4.7	*
3.3	2.1		2.8	3.3	2.1	
1.3	0.7		.5	1.6	.9	
3.1	8.7		6.3	6.1	5.3	
6.0	5.6		6.3	6.2	5.0	
2.6	1.5		1.3	3.2	1.7	

* Significant at least at .05 > p. Next to description refers to multivariate test. Next to matrix corresponds to univariate test for that one dependent measure.
Each array of five numbers corresponds respectively to cooperating, giving, touching, verbalizing, and imitation.

TABLE 5 (Cont.)

Experiment II

Condition X Age (-) =

	Y	O	
B	3.2	1.8	-
	.6	.7	-
	4.0	7.4	-
	3.9	4.8	-
	.9	1.8	-
R	4.4	2.6	
	1.7	1.0	
	5.7	11.2	
	5.4	5.2	
	3.3	4.8	
P	3.4	2.6	
	1.7	1.2	
	3.5	8.9	
	3.3	6.1	
	2.8	3.7	

Condition X Age (-) X Order =

	BRO-Y	BRP-O	BPR-Y	BPR-O	
B	3.1	1.3	3.2	2.3	-
	.6	1.0	.6	.3	-
	4.5	5.7	3.5	9.1	-
	2.3	2.5	5.5	7.1	-
	.7	2.2	1.1	1.4	**
R	4.8	2.5	4.0	2.7	
	1.3	.9	2.1	1.1	
	8.1	13.6	3.3	8.8	
	3.1	5.7	7.7	5.1	
	2.1	7.7	4.5	1.8	
P	3.9	1.8	2.8	1.4	
	2.1	1.7	1.2	.6	
	4.6	9.6	2.4	8.1	
	1.7	7.0	4.8	5.2	
	3.4	6.0	2.1	1.3	

* Significant at least at .05 > p. Next to description refers to multivariate test. Next to matrix corresponds to univariate test for that one dependent measure.

Each array of five numbers corresponds respectively to cooperation, giving, touching, verbalizing, and imitation.

also a significant factor although neither order was consistently better. Groups in which Reinforcement of unprompted social behavior preceded Prompting and Reinforcing has significantly more touching and imitation when all conditions were combined. There was significantly more verbalizing when Prompting and Reinforcement preceded Reinforcement of unprompted social behavior. Different treatments were differentially affected by the order in which they were presented, but no consistent trends were noticed even with touching and imitation which were significant by themselves. As in Experiment I, the age-order interaction was significant. Since each age-order combination is represented by a unique group, the interaction could be due to unbalanced differences between the four groups.

Treatment differentially affected social responding which indicates that the way children are taught significantly affects their subsequent social responding. When all four groups were averaged, Baseline was lowest for all social behavior and Reinforcement of unprompted social behavior was highest with Prompting and Reinforcement intermediate (see Figure 3). These trends were significant for each of giving, touching, and imitation considered alone. A Newman-Keuls analysis had been planned to determine which treatment accounted for the univariate significance, but none of the Studentized Range Statistics were significant (Table 6), so the test could not be performed (Winer, 1962). There was no differential responding of large and small children to the treatments;

FIGURE 3: AVERAGE OF ALL GROUPS, EXPERIMENT II

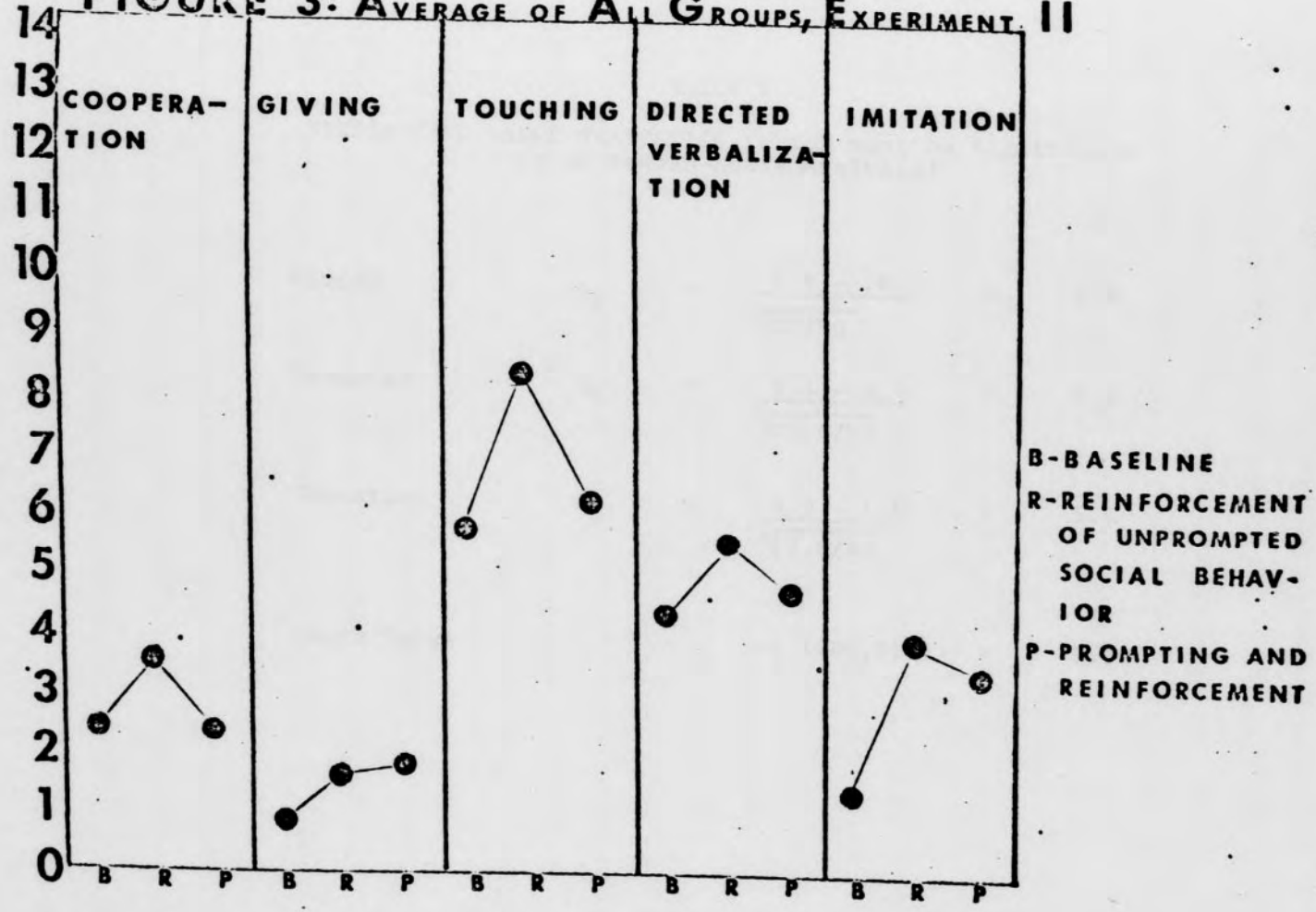


TABLE 6

STUDENTIZED RANGE STATISTICS (Which must be Significant to do Newman-Keuls Analysis)

Giving	q_g	=	$\frac{1.4 - .6}{\sqrt{20/40}}$	=	3.6
Touching	q_t	=	$\frac{8.5 - 5.7}{\sqrt{21.8/40}}$	=	3.8
Imitation	q_i	=	$\frac{4.0 - 1.5}{\sqrt{7.3/40}}$	=	5.8
Table Value			q (.05,3,2)	=	8.3

teaching method affected both large and small children similarly. Reinforcement of unprompted social behavior always resulted in the maximum amount of cooperation and touching. A change to Prompting and Reinforcement always resulted in a decreased amount of cooperation and touching from previous levels. Giving, which occurred relatively infrequently and had the lowest observer reliability, increased over time regardless of condition. Since both teaching methods were presented in both orders, and since giving increased over time regardless of condition, when orders are average both teaching methods resulted in more free play responds than Baseline but were equal to each other, which is why statistically there is a significant treatment effect for giving. In three out of four zones, Reinforcement of unprompted social behavior increased verbalizations and Prompting and Reinforcement decreased verbalizations over previous levels. Reinforcement of unprompted social behavior always increased imitation above previous levels and Prompting and Reinforcement had differential effects.

Data from the five children who interacted least during Baseline were considered separately. For cooperation and giving, Prompting and Reinforcement resulted in more behavior than Reinforcement of unprompted social behavior in three cases; both methods were equivalent in two cases. Prompting and Reinforcement resulted in more imitation two times and was equivalent to Reinforcement of unprompted social behavior

three times. For verbalization, neither method improved Baseline responding. For touching, both methods were superior once and they were equivalent three times. Thus, Prompting and Reinforcement was superior to reinforcement alone for these children.

Discussion

The results obtained in Experiment II are clearer than those from Experiment I. Reinforcement of unprompted social behavior is clearly the most effective method to use in a structured teaching situation to increase cooperation, touching, imitation, and probably verbalizing in a subsequent free-play setting. Giving was not affected by different methods.

In a free play situation, social behavior is elicited by toys available and by the presence and behavior of other children. In the reinforcement alone condition, social behavior in this context as well as the initiation of social contacts without adult prompts were reinforced. Thus, social behavior in the context of diverse situational cues was increased. When Prompting and Reinforcement were used, children learned to perform social behavior in one specific situation, namely when that behavior was prompted by an adult. Social responding to other situational cues was not reinforced. Later when the adult prompts were withheld, the children were not able to generalize their responding to the free play situation. Thus, free play responding for children was higher after they received reinforcement for initiating and performing social behavior

in a free play context than when only their social responding in the presence of adult prompts was reinforced.

Reinforcement of unprompted social behavior could only be successful for children who had some initial baserate of social responding. This is evidenced by the data from the five children with the lowest level of unprompted social responding during baseline. Prompting and reinforcement resulted in more subsequent social behavior during free play than reinforcement alone. If children are interacting rarely to begin with, it is unlikely that they will receive much reinforcement for social behavior unless the behavior is first prompted.

CHAPTER V

CONCLUSION

Social behavior is indeed a complex phenomenon and no one method of teaching was superior for all behaviors or all children. The five dependent measures did not always represent discrete events; however, they varied differentially with different treatments. The correlates between the particular dependent measures used are far too complex for this study to determine.

It was surprising to find that teaching a particular social behavior was an ineffective method to increase the subsequent occurrance of that behavior in free play. A fatigue effect where children might not keep practicing a particular behavior immediately after a training session cannot account for the results because observations removed from training by a day were consistent with observations immediately after training. These results could imply that children learn much more than the specific behaviors taught. They may learn to attend to peers, orient objects towards peers, to perform motor behavior directed towards peers, and other social skills which generalize in free play differentially to an array of social behaviors.

Of most interest is the finding that reinforcing unprompted occurrances of social behavior resulted in more subsequent social responding during free play than prompting a

variety of different activities and reinforcing the children for participating. This may in part account for the weak results in Experiment I since this experiment used prompting in all phases. An interesting future research study would involve replicating Experiment I but reinforcing unprompted occurrances of specific social behavior.

The finding that Reinforcement of unprompted social behavior is better than Prompting and Reinforcing has some general implications for teachers of all behaviors. It is probably that many behaviors that are measured outside the direct teaching situation could be taught by reinforcing unprompted occurrances of the behavior. This may apply to such behaviors as independent study, in seat behavior, artistic work, reading alone, as well as various social behaviors such as manners, restraining aggression, and peer interaction. This technique may be particularly effective in teaching creativity. Goetz and Baer (1973) increased creative block building by reinforcing spontaneous novel block structures each day. More work must be done to determine what behaviors would benefit most from such a technique.

Before Reinforcement of unprompted social behavior can be effective, the child must perform the behavior at a non-zero baserate. If the child performs the behavior only rarely, it is an inefficient use of a teacher's time indeed to wait for the behavior to occur. The five children with the lowest baserates of behavior did not benefit from the reinforcement alone condition. Perhaps the best method for

children of all levels would be to divide teaching time between periods of prompting to teach new behaviors that occur infrequently and periods of reinforcement alone so that the newly taught behavior can be performed under the appropriate stimulus conditions. The optimal amount of time spent in each condition would probably vary as a function of the child's baserate of the target behavior; for any child, advanced skills could be prompted and easy skills reinforced when they occur without prompting.

Future research needs to be performed to determine whether reinforcement alone is effective for other behaviors and if a combination of the two methods is more effective than either alone. Research should also be extended to normal populations in order to determine the generality of the results. In addition, the generality of the results are seriously jeopardized by the fact that one person designed the study, taught all the children, and recorded and analyzed the data; certain biases or individual characteristics could have interacted with the conditions, although the author took every precaution to be as impartial as possible.

The results found in this study should encourage more research in applied situations. Highly controlled laboratory research is useful to determine principles of behavior, but often the situations are so contrived and controlled that results do not generalize directly to the classroom. This author suggests that more research needs to be performed to empirically determine useful techniques especially for teaching

developmentally disabled children in group situations. Later laboratory research can then analyze the important aspects of useful methods and their generality.

This study should also encourage future research into the nature of social behavior. The literature to date shows a great paucity of techniques to remediate general social deficits although it is generally agreed that social behavior is an extremely important aspect of the child's behavior.

CHAPTER VI

SUMMARY

The purpose of this thesis was to investigate the social behavior of developmentally disabled children. The sparce literature on the social behavior of disabled children indicates that these children's social responding differs both qualitatively and quantitatively from normal children of the same chronological or mental age. There is agreement that the deficit in social responding is serious, but no group or individual techniques have been proposed to ameliorate the problem in these children. This thesis examines the feasibility of several techniques to teach behavior to children that will generalize to a free play situation.

Two experiments were performed. Both involved four groups of children ranging from two to ten years of age. The children were classified by the teaching staff as either large or small, based on age, strength, and size; children were grouped accordingly. A checklist of social responding indicates that small children engage in fewer kinds of social behaviors (less advanced behaviors).

After a twenty minute training session, children were observed for five minutes of free play. Cooperation, giving, touching, directed verbalizing, and imitation were simultaneously observed by a time sampling technique of observation. Data

indicate that observations at the end of a session do not often vary from observations at the beginning of the next session; variations tend to indicate that children perform more social behavior at the beginning of a session. Only data from the end of each session were used in analyses. Absences of one or more children coincided with less social behavior, but the distribution of absences should not have inflated results.

In Experiment I, a baseline of non-social perceptual training was followed by training imitation, giving, and touching in one of two specified orders. Two orders and two ages were crossed for the four groups. Training a particular response in the structured touching situation did not produce changes in that response in the criterion free play situation. The interrelations among social responses are difficult to determine from this study. At any rate, it appears inefficient to teach one particular social behavior to increase that behavior in a subsequent free play setting.

In Experiment II, a baseline of non-social perceptual training was followed by either prompting and reinforcing a variety of social behavior or by reinforcing spontaneous occurrances of social behavior. The second technique proved superior for all the children considered together; it thus appears that one must teach children how to initiate social responding rather than teach them new responses in a teaching situation. However, children with very low rates of social responding improved most when social behavior was prompted and reinforced. It suggested that combination of the two techniques may be most advantitous.

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APPENDIX A

Name: _____

Assessor: _____

Responds to others

___interest in caretaker
___regards children
___touches child
___shakes hands with child
___hugs or kisses child
___points to X (shown where)
___points to X (knows name)
___points to X's ears, nose, hair
___says "hi X"
___enters play house with another child
___does errands

Imitation, Attention, Wait Turn (Group Work)

___attends to adults
___looks at adult "look at me"
___claps hands, pats head
___general gross motor imitation
___general fine motor facial imitation
___imitates sounds
___imitates other children's play
___claps through "if you're happy"
___does most motions with (score 6)

___if you're happy
___ears hang low
___hummingbird
___open shut
___spider
___wheels on bus
___head shoulders
___red light
___noble duke

___plays lion hunt
___sings some words
___sings most of some song
___pass object around circle
___pass hat head to head
___food in center, take one in turn
___food in center, take two and give one

Appendix A (Cont.)

___work on individual tasks, stays in circle
___group work, waits turn for attention
___all be something (train, elephant, bird)
___take turns throwing ball in yellow box
___put specific color bead on string in turn
___will raise hand before answering
___follows child 'do this'
___leads 'do this'
___listens to story

Giving

___gives neutral object to adult
___gives neutral object to child
___gives exciting toy to adult
___gives exciting toy to child
___gives food to another child
___red train, roll back and forth
___roll ball

Cooperation

___work in same location
___work on same structure, with adult
___build in alternation
___in circle, add block in turn
___put one ring on stack in turn
___roll red train back and forth
(adult drops reinforcer in)
___swivel chair, push child for ride
___carry same object
___all color same picture

Games

___will rock with partner to row-row
___will play ring-around-the-rosey
___plays ring-around-the-rosey and falls down
___ring-around X (inside and out position)
___London Bridge, the bridge
___London Bridge, walks under
___pat-a-cake with adult, two motions
___pat-a-cake with child, one motion
___pat-a-cake with child, two motions

Appendix A (Cont.)

___plays "feeley-meeley" in turn
___plays rock-a-boat
___mails letters back and forth in house
____duck, duck goose
____number bingo
____animal serades
____what am I?
____hide the thimble
____smile game
____old maid
____will race for reward
____will name three peers
____will play dolls, tea party, plays house
____plays tag or hide'n seek

APPENDIX B1

OBSERVATION SHEET

C	1	2	3	4
G	1	2	3	4
T	1	2	3	4
V	1	2	3	4
I	1	2	3	4
N				

C	1	2	3	4
G	1	2	3	4
T	1	2	3	4
V	1	2	3	4
I	1	2	3	4
N				

C	1	2	3	4
G	1	2	3	4
T	1	2	3	4
V	1	2	3	4
I	1	2	3	4
N				

C	1	2	3	4
G	1	2	3	4
T	1	2	3	4
V	1	2	3	4
I	1	2	3	4
N				

C	1	2	3	4
G	1	2	3	4
T	1	2	3	4
V	1	2	3	4
I	1	2	3	4
N				

C	1	2	3	4
G	1	2	3	4
T	1	2	3	4
V	1	2	3	4
I	1	2	3	4
N				

C	1	2	3	4
G	1	2	3	4
T	1	2	3	4
V	1	2	3	4
I	1	2	3	4
N				

C	1	2	3	4
G	1	2	3	4
T	1	2	3	4
V	1	2	3	4
I	1	2	3	4
N				

C	1	2	3	4
G	1	2	3	4
T	1	2	3	4
V	1	2	3	4
I	1	2	3	4
N				

C	1	2	3	4
G	1	2	3	4
T	1	2	3	4
V	1	2	3	4
I	1	2	3	4
N				

C	1	2	3	4
G	1	2	3	4
T	1	2	3	4
V	1	2	3	4
I	1	2	3	4
N				

C	1	2	3	4
G	1	2	3	4
T	1	2	3	4
V	1	2	3	4
I	1	2	3	4
N				

1 _____

2 _____

3 _____

4 _____

	1	2	3	4
C				
G				
T				
V				
I				

observer _____

date _____

APPENDIX B 2

OBSERVATION SHEET

C	1	2	3	4	5
G	1	2	3	4	5
T	1	2	3	4	5
V	1	2	3	4	5
I	1	2	3	4	5
N					

APPENDIX C

DIFFERENT SOCIAL RESPONSES

Cooperation: Two children use the same object; use implies mutual manipulation of Y (not just sitting on same object).

Giving: One child holds Y which is transferred by T to another child who receives Y.

Touching: One child makes contact between Y that he is holding or X on his body and X on another child.

Directed Verbalization: One child vocalizes speech sounds while looking at another child's face of content is obviously directed towards another child.

Parallel Response (Imitation): Two children manipulate Y's in the same manner or two children perform the same voluntary motor behavior (except walking sitting, etc.) or speak the same sound at the same time or in immediate succession.

X The following body parts: hand, arm, leg, foot, hair, face, stomach or chest, and back. Also any combination of these.

Y Any object in the room (same objects such as blocks do not count differently).

T Any method of transferrence such as rolling, handing, gentil tossing, etc. or plaing an object down and having it immediately picked up.

APPENDIX D

SESSION BY SESSION GROUP SCORES AND MEANS FOR EXPERIMENT I

Group B-I-G-T, Small

Baseline	1	2*	3	4	5	6	beg	7	8	9	beg	10	11	beg	avg end	avg beg
C	2	0	0	0	3	3	1	2	5	0	2	11	2	0	2.5	1
G	0	1	0	3	0	1	4	1	1	3	0	0	1	0	1	1.3
T	3	1	0	9	4	3	14	6	4	6	0	3	2	2	3.7	5.3
V	0	0	0	2	0	0	1	1	0	2	1	1	3	1	.8	1
I	0	0	0	2	3	2	2	3	3	1	1	4	3	1	1.9	1.3

* at least one child absent

APPENDIX D (Cont.)

Imitation Training	1	2	3	4*	5	6	beg	7	8*	9	beg	10	11	beg	Avg end	Avg beg
C	1	3	6	0	0	13	6	9	4	6	1	0	5	0	4.3	2.3
G	1	2	2	0	0	2	1	0	3	1	0	1	1	1	1.2	.7
T	5	1	6	4	1	14	13	10	13	7	1	2	9	0	6.5	4.7
V	0	0	1	1	1	1	4	0	1	0	2	3	1	0	.8	2.0
I	1	0	6	1	0	4	0	0	2	1	0	1	4	0	1.8	0

Give Training	1	2*	3*	4*	5*	6*	beg*	7*	8*	9*	beg*	10*	11*	beg*	avg end	avg beg
C	0	0	6	4	14	0	1	0	0	0	2	9	0	1	3	1.3
G	0	0	0	4	12	0	0	0	0	0	0	3	0	0	1.8	0
T	2	2	14	7	15	0	8	0	0	3	7	14	0	3	5.2	6.0
V	0	0	10	0	16	0	0	0	1	0	1	5	0	0	2.9	.3
I	0	0	0	2	0	0	0	0	0	0	0	7	0	0	.9	0

* at least one child absent

APPENDIX D (Cont.)

Touch Training	1	2	3	4	5	6	beg	7	8	9	beg	10	11	beg	avg end	avg beg
C	0	2	2	1	20	11	0	1	0	1	0	7	16	2	5.5	.7
G	0	1	11	6	4	0	0	2	0	1	2	7	3	0	3.2	.7
T	3	3	11	8	12	13	0	7	0	5	0	11	10	6	7.5	2.0
V	0	0	7	3	6	1	2	8	0	7	2	8	6	4	4.2	2.7
I	0	1	2	0	0	0	0	2	0	0	0	0	2	1	.7	.3

Group B-I-T-G, Large

		1*	2	3	4	5	6	beg	7	8*	9	beg	10	11	beg	avg end	avg beg
Baseline	C	0	0	20	1	2	2	4	0	0	0	8	6	3	9	3.1	7.0
	G	0	2	0	0	3	2	3	2	0	6	0	1	1	8	1.7	3.7
	T	2	10	17	15	15	12	17	12	1	15	20	20	7	20	11.5	19.0
	V	0	11	20	6	2	9	1	5	1	2	1	0	2	1	5.3	1.0
	I	1	0	20	0	2	0	0	1	0	0	7	0	5	5	2.6	4.0
		1	2	3	4	5	6	beg	7	8*	9	beg	10	11	beg	avg end	avg beg
Imitation Training	C	11	7	7	8	6	13	13	11	1	1	3	12	3	6	7.3	7.3
	G	1	2	2	12	5	5	13	1	3	5	2	0	3	1	3.5	5.3
	T	16	17	13	6	16	14	17	16	1	16	15	5	13	11	12.0	14.3
	V	2	7	0	1	1	3	0	4	1	2	3	2	2	0	2.3	1.0
	I	1	0	1	0	0	0	0	0	0	0	0	16	0	3	1.7	1.0

* at least one child absent

APPENDIX D (Cont.)

Touch Training	1*	2	3*	4*	5*	6	beg*	7*	8*	9	beg*	10*	11*	beg*	avg end	avg beg
C	5	5	0	0	1	1	2	1	2	0	5	3	7	2	2.3	3.0
G	2	4	0	0	5	12	1	1	1	5	6	5	5	5	3.6	4.0
T	12	17	2	3	4	14	7	8	2	20	1	8	9	2	9.0	3.3
V	2	5	1	0	1	6	3	2	1	4	0	1	0	4	2.1	2.3
I	0	1	0	0	0	0	0	0	9	16	0	0	2	0	2.5	0

Give Training	1*	2*	3*	4*	5	6	7*	beg	8	9	beg	10	11	beg	avg end	avg beg
C	13	9	7	10	3	2	0	1	9	6	11	9	3	1	6.5	4.3
G	0	2	9	3	3	1	0	0	0	0	11	4	2	1	2.2	4.0
T	14	11	1	11	8	17	2	16	5	12	19	16	14	9	10.1	14.7
V	1	1	1	2	13	5	0	9	8	13	18	16	6	18	6.0	15.0
I	1	2	0	0	0	0	0	0	0	3	4	2	0	0	.7	1.3

* at least one child absent

APPENDIX D (Cont.)

Group B-I-T-G, Small

		1	2	3	4*	5*	6*	beg	7	8	9	beg	10	11	beg*	avg end	avg beg
Baseline	C	0	0	0	1	0	0	1	0	1	0	0	0	0	0	.2	.3
	G	0	0	1	1	0	0	2	2	0	0	0	0	0	0	.4	.7
	T	0	1	0	4	0	0	6	4	4	0	2	5	1	0	1.7	2.7
	V	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	I	0	0	0	3	0	0	1	0	0	0	0	4	0	2	.6	1.0
		1*	2	3	4	5*	6*	beg*	7*	8*	9	beg	10	11	beg	avg end	avg beg
Imitation Training	C	0	0	0	0	0	0	0	4	1	0	1	1	1	0	.6	.3
	G	0	0	0	1	0	0	0	0	0	0	0	0	0	1	.1	.3
	T	0	5	9	7	5	0	0	4	5	15	3	1	5	3	5.1	2.0
	V	0	0	0	0	0	0	0	0	0	1	0	0	0	0	.1	0
	I	0	0	4	2	0	0	0	3	0	0	0	0	0	1	.8	.3

* at least one child absent

APPENDIX D (Cont.)

Touch Training	1	2*	3*	4	5*	6	beg	7*	8*	9*	beg*	10*		avg end	avg beg
C	1	7	0	2	0	1	1	0	7	0	0	0		1.8	.5
G	0	0	0	1	0	3	0	0	0	0	1	1		.5	.5
T	1	5	0	7	0	6	6	4	8	2	2	2		3.5	4.0
V	0	0	0	1	0	2	0	1	1	0	0	0		.5	0
I	0	3	0	0	0	0	1	1	4	0	0	0		.8	.5

Give Training	1*	2	3	4	5*	6	7	8	beg	9	beg	10	11	avg end	avg beg
C	0	0	0	2	3	1	0	0	5	1	0	0	4	1.0	2.5
G	0	0	0	0	0	1	0	0	0	1	0	0	0	.2	0
T	0	2	7	5	4	6	0	2	9	12	0	0	17	5.0	4.5
V	0	0	4	0	1	1	0	1	1	2	0	0	1	.9	.5
I	0	0	0	2	4	0	0	0	0	0	0	0	2	.7	0

* at least one child absent

APPENDIX D (Cont.)

Group B-I-G-T, Large

		1	2	3	4	5	6	beg	7	8	9	beg	10	11	beg	avg end	avg beg
Baseline	C	1	0	9	1	5	1	1	15	0	0	0	3	5	1	3.6	.7
	G	3	2	1	1	6	1	3	1	0	0	0	4	4	1	2.1	1.3
	T	14	7	6	10	6	12	14	9	20	16	20	10	10	12	10.9	15.3
	V	2	0	0	0	2	0	1	1	2	0	1	0	0	0	.6	.7
	I	3	4	0	0	0	0	0	1	0	1	0	3	7	2	1.6	.7
Imitation		1	2	3	4	5	6	beg	7	8*	9*	beg	10*	11	beg	avgend	avgbeg
Training	C	2	0	1	6	0	10	1	0	5	18	0	0	8	1	4.5	.7
	G	0	2	0	2	2	0	1	1	3	0	0	1	1	0	1.1	.3
	T	7	9	12	8	8	10	16	8	15	2	1	20	9	14	9.8	10.3
	V	0	0	2	2	1	0	7	1	1	0	0	15	1	1	2.1	2.7
	I	2	0	4	0	2	6	5	1	0	1	0	1	0	0	1.5	1.7

* at least one child absent

APPENDIX D (Cont.)

Give Training		1	2	3	4*	5	6*	beg	7*	8*	9*	beg	10	11	beg	avg end	avg beg
	C	0	2	1	0	4	1	1	0	10	1	4	19	4	6	3.8	3.7
	G	0	0	0	0	1	0	0	1	3	2	2	1	4	6	1.1	2.7
	T	16	5	2	0	19	14	8	0	17	7	6	15	17	11	10.2	8.3
	V	9	2	0	0	1	0	1	0	1	0	5	0	1	3	1.3	3.0
	I	0	0	0	0	1	1	2	2	4	2	5	3	0	3	1.2	3.3

Touch Training		1	2	3*	4*	5*	6*	beg*	7*	8*	beg*	9*	10*	beg*		avg end	avg beg
	C	2	4	0	1	1	2	0	3	5	17	0	0	0		1.8	5.7
	G	4	2	1	1	1	3	0	1	0	0	0	2	2		1.5	.7
	T	15	11	2	1	3	11	1	4	8	16	6	6	9		6.7	8.7
	V	1	1	0	0	0	1	0	2	1	0	4	4	1		1.4	.3
	I	3	3	0	1	0	1	1	4	8	3	2	3	3		2.5	2.3

* at least one child absent

APPENDIX E

Design Format for Analyses-Experiment I

Group	Day	Condition: Baseline	Imitation	Giving	Touching
Order One (B-I-G-T) Younger Children	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	10				
	11				
Order One (B-I-G-T) Older Children	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	10				
	11				
Order Two (B-I-T-G) Younger Children	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	10				
	11				
Order Two (B-I-T-G) Older Children	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	10				
	11				

APPENDIX F

SESSION BY SESSION GROUP SCORES AND MEANS FOR EXPERIMENT II

Group B-R-P, Small

	1*	2	3	4	5*	beg*	g*	7*	8*	beg	9	10*	beg	avg end	avg beg
Baseline															
C	17	1	0	3	0	12	3	2	0	0	5	0	4	3.1	5.3
G	0	0	0	3	0	1	1	0	1	0	0	1	1	.6	.7
T	1	9	0	3	16	1	7	0	1	15	3	5	0	4.5	5.3
V	3	0	0	4	2	6	2	2	1	1	9	0	0	2.3	2.3
I	5	0	0	2	0	8	0	0	0	0	0	0	0	.7	2.7

* at least one child absent

APPENDIX F (Cont.)

Reinforcement of unprompted behavior		1	2	3	4	5	6*	beg*	7*	8*	9*	beg*	10*	beg	avg end	avg beg
	C	15	7	13	2	0	5	3	2	0	1	8	3	19	4.8	10.0
	G	1	0	1	0	0	8	2	1	1	1	4	0	0	1.3	2.0
	T	7	7	12	6	8	10	7	3	6	19	5	3	4	8.1	5.3
	V	5	0	4	2	9	4	2	1	4	2	5	0	0	3.1	2.3
	I	10	1	2	3	1	2	5	1	0	0	3	1	3	2.1	3.7

Prompt and Reinforcement		1	2*	3*	4	5	6*	beg*	7*	8*		beg*	9*		avg end	avg beg
	C	5	0	6	0	10	8	1	2	1		4	3		3.9	2.5
	G	0	6	2	1	4	4	0	1	0		5	1		2.1	2.5
	T	4	6	1	15	6	1	17	0	9		0	0		4.6	8.5
	V	1	0	5	2	1	3	4	0	0		6	4		1.8	5.0
	I	10	1	5	0	4	2	0	3	3		4	3		3.4	2.0

* at least one child absent

APPENDIX F (Cont.)

Group B-P-R, Large

		1	2	3*	4*	5	beg	6	7	8	beg*	9*	10	beg	avg end	avg beg
Baseline	C	2	5	6	4	2	0	1	0	1	11	2	0	2	2.3	4.3
	G	1	0	0	0	0	0	0	0	1	0	0	1	0	.3	0
	T	13	12	6	10	2	14	16	4	7	7	7	14	7	9.1	9.3
	V	8	6	7	8	3	12	17	3	12	1	5	2	6	7.1	6.3
	I	4	0	0	1	0	7	5	2	1	0	0	1	0	1.4	2.3

* at least one child absent

APPENDIX F (Cont.)

Prompting and Reinforcement	1*	2	3	4*	5	6*	7*	beg*	8*	beg*	9*	10*	beg*	avg end	avg beg
C	0	0	5	1	1	0	1	1	1	1	1	4	2	1.4	.7
G	0	0	0	0	0	3	3	0	0	1	0	0	0	.6	.7
T	9	6	6	15	3	10	7	12	10	1	8	7	7	8.1	1.7
V	3	4	8	18	3	1	4	1	1	0	2	8	10	5.2	2.0
I	1	1	0	4	2	0	0	0	2	1	0	3	0	1.3	.3

Reinforcement of Unprompted Social Behavior	1	2*	3*	4	5	beg	6	7*	8*	beg	9	10	beg	avg end	avg beg
C	0	5	1	4	2	3	5	4	3	2	1	2	0	2.9	1.6
G	1	0	0	0	3	0	3	2	0	2	2	0	1	1.0	1.0
T	4	9	0	6	17	9	18	9	4	8	14	7	3	8.8	6.6
V	5	7	0	5	8	5	5	3	1	8	11	1	9	5.1	7.3
I	0	2	0	4	1	2	0	3	3	2	4	1	0	1.8	1.3

* at least one child absent

APPENDIX F (Cont.)

Group B-P-R, Small

		1	2	3	4*	5	beg	6	7	beg*	8	9*	10*	beg*	avg end	avg beg
Baseline	C	4	3	1	1	5	0	0	4	0	6	1	7	3	3.2	1.0
	G	0	0	1	0	0	4	3	0	2	0	0	2	3	.6	3.0
	T	12	4	0	1	4	1	3	1	3	8	0	2	1	3.5	1.7
	V	13	3	2	3	6	7	7	5	2	9	0	7	2	5.5	3.7
	I	1	0	0	1	1	3	0	0	1	6	0	2	11	1.1	5.0

* at least one child absent

APPENDIX F (Cont.)

		1*	2*	3*	4*	5	6	7	beg	8	9	beg	10	beg	avg end	avg beg
Prompt and Reinforcement	C	0	0	12	1	4	0	6	5	2	0	1	3	0	2.8	2.0
	G	3	1	0	4	0	0	1	3	2	1	2	0	1	1.2	3.0
	T	1	7	0	2	5	0	6	1	3	0	0	0	1	2.4	.7
	V	3	3	11	8	9	6	2	7	2	4	0	0	2	4.8	3.3
	I	2	0	0	0	10	6	1	4	1	1	0	0	0	2.1	1.3

		1	2	3	4	5	6	beg	7	8	beg	9	10	beg	avg end	avg beg
Reinforcement of Unprompted Social Behavior	C	1	0	4	4	8	1	11	3	14	4	0	4	8	3.9	7.7
	G	4	2	2	7	0	1	2	2	2	0	0	1	0	2.1	.7
	T	5	2	4	3	5	7	0	1	1	0	3	2	7	3.3	2.3
	V	11	0	15	8	12	6	6	8	9	3	4	4	4	7.7	4.3
	I	4	0	1	9	4	7	5	0	4	3	14	2	7	4.5	5.0

* at least one child absent

APPENDIX F (Cont.)

Group B-R-P, Large

		1	2*	3	4	5	6*	beg	7	8	beg*	9*	10*	beg*	avg end	avg beg
Baseline	C	4	5	0	1	0	0	12	1	1	4	1	0	0	1.3	5.3
	G	0	1	2	0	4	2	1	1	0	0	0	0	0	1.0	.3
	T	5	11	4	3	0	10	13	0	17	10	7	0	1	5.7	8.0
	V	7	0	1	3	0	5	2	0	7	3	2	0	2	2.5	2.3
	I	1	9	2	2	3	0	5	1	1	1	3	0	0	2.2	2.0

* at least one child absent

APPENDIX F (Cont.)

		1	2	3	4	5	6	beg	7	8*	beg*	9*	10	beg	avg end	avg beg
Reinforcement of Unprompted Social Behavior	C	0	1	1	5	1	6	0	6	0	2	2	3	7	2.5	3.0
	G	1	1	0	0	2	2	2	0	0	1	1	2	13	.9	5.3
	T	11	18	13	15	18	13	4	12	16	11	8	12	6	13.6	7.0
	V	14	5	6	9	3	7	2	2	0	2	3	8	8	5.7	4.0
	I	6	12	8	11	3	4	4	11	11	13	1	10	9	7.7	8.7

		1	2	3	4	5	6	beg*	7*	8	beg	9	10	beg	avg end	avg beg
Prompt and Reinforcement	C	0	6	4	3	1	1	0	0	1	4	0	2	6	1.8	3.3
	G	0	3	3	4	0	2	0	0	1	2	1	3	3	1.7	1.7
	T	13	10	12	14	18	1	1	2	2	9	19	5	14	9.6	8.0
	V	11	9	13	9	13	4	0	1	1	5	3	6	6	7.0	3.7
	I	11	11	7	8	3	0	0	0	3	4	12	5	6	6.0	3.7

* at least one child absent

APPENDIX G

Design Format for Analyses-Experiment II

Group	Day	Condition: Baseline	Reinforcement	Prompt and Reinforcement
Order One (B-R-P) Younger Children	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
Order One (B-R-P) Older Children	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
Order Two (B-P-R) Younger Children	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			
Order Two (B-P-R) Older Children	1			
	2			
	3			
	4			
	5			
	6			
	7			
	8			
	9			
	10			